SAGE
Southern Alberta Group for the Environment

We cannot command Nature except by obeying her.
~ Francis Bacon

June 2010

Special points of interest:

* Spray Lake Sawmills target Castle Special Places for clear-cutting.
* Lethbridge College is awarded over $1 million to develop training programs for wind and other alternative energy technologies.
* North Lethbridge Regional Park to be located north of Uplands. Report available at City of Lethbridge.

Net-Zero Home Design

Greensence, SACPA, and the Green Leadership Office hosted Gordon Howell at Lethbridge College to discuss net-zero home design. A video of the talk is available at www.glolethbridge.ca. The principle of a net-zero home is to improve the performance of the home so as to reduce the energy required for heating. This entails good insulation (R50 walls and R100 roof in one example provided), controlled air exchange using a heat recovery ventilator, and optimizing passive energy gains from the sun through south-facing windows. Howell suggests that a 65% reduction in heating energy is achievable for a 15 to 20 thousand dollar investment when building a new home.

Based on the evolution of three net-zero homes in Edmonton, the design team has moved away from combinations of solar thermal (flat-plate collectors to warm water) and photovoltaic (solar electricity generation), to a system where the home and water is heated using only photovoltaic (PV). The argument is that by using only PV, the complexity of design and operation is reduced and the energy (and financial) costs of installing multiple systems is avoided. The photovoltaic system is sized to provide the electricity required to operate electronics and appliances (which is lost as heat in the home), to heat water, and to heat the home. The system is connected to the grid, so that electricity is drawn from the grid when the PV system is not operating (i.e., night) and the PV systems produces to the grid when the sun is shining - the 'net' in net-zero home implies that the difference of what goes in and what comes out of the grid is zero.

Advocating for the Castle Crown

During a Minsters visit to Lethbridge, a group of advocates for the protection of the Castle Crown Wilderness Area organized a public awareness event. The Castle Special Place provides roughly a third of the fresh water that the region requires for municipal and agricultural use. A healthy watershed helps ensure the quality and quantity of water required in the region. Minister Mel Knight was quoted as saying that the clear cutting approved for the area falls within the planned guidelines for the future exploitation of natural resources in southern Alberta.

Comments on Net-Zero Home Design

Questions raised after the talk on net-zero homes focused on the importance of reducing consumption (behavioural change) as being the most effective approach to reduce greenhouse gas emissions.

Another concern was the fixation on achieving net-zero energy compared to a more holistic design approach. The analysis of net-zero occurs after the home has been built (and does not necessarily consider the energy embodied in the system). For example, each additional thickness of insulation in the roof saves a diminishing amount of energy from heat loss. At a certain thickness, it takes more energy to make the insulation than will ever be saved from home heating – at this point the net energy (from a more holistic perspective) is increasing.

When one tugs at a single thing in nature, he finds it attached to the rest of the world.

John Muir

Carbon-dioxide emissions for different energy technologies:

Coal-fired electricity	= 975	g-CO_2/kWh
Solar thermal	= 13.6 to 202	g-CO_2/kWh
Hydro	= 3.7 to 237	g-CO_2/kWh
Solar photovoltaic (PV)	= 53 to 250	g-CO_2/kWh
Wind	= 9.7 to 124	g-CO_2/kWh

The ranges indicate that the emissions vary with manufacturing, transportation, and performance (which is related to design and location).

Source: Varun, Bhat & Prakash (2009). LCA of renewable energy for electricity generation systems—A review. *Renewable and Sustainable Energy Reviews, 13* (1067-1073).

It should also be noted that it takes energy to make photovoltaic systems – and this energy is fossil fuel based.

In essence, solar PV is a fossil fuel electricity generator.

A more useful design approach is to look at the CO_2 emissions per kWh of energy produced and apply the technology best suited to the location (see Box).

PV electricity is clearly much better than what the Alberta grid provides, but there are applications that a natural gas furnace at 215 g-CO_2/kWh could produce less CO_2 than PV for home heating. This is not an argument against PV - it is an argument for a more holistic analysis, and it is primarily an argument for *real* reduction through behavioural change.

Coming Events & Sources:

Environment Week: June 2, 5:30 p.m. City Hall—3rd Annual Bike and BBQ
www.discovergreen.ca/bikebbq.html

Riparian Health Inventory: June 9th, 10:30 to 12 noon, Lethbridge Public Library.

Water Matters - Making the Connection: Water and Land in Alberta http://www.water-matters.org/story/373

Southern Alberta Group for the Environment (SAGE)

A Leading Voice for a Healthy and Environmentally Sustainable Community.

Visit us at: http://sage-environment.org/

If you are interesting in getting involved, contact us at:

info@sage-environment.org

Tyson Bohnert—Caring for our Watershed (Special Feature)

Tyson, naturally an early riser, awoke this morning to make his lunch, before biking off to plant some local, organic, well-sprouted potatoes in the garden at his Great Granny Smith's. Tyson has been in charge of our family's expanding garden space for six years, and when Granny mentioned that she was not able to plant a garden this year, Tyson asked if he could be responsible to plant and manage the garden space, with the vision of a great corn field in mind. Tyson has inspired the help of his brother (10 years) and sister (4 years), parents, and neighbour friends to help acquire heritage seeds, prepare the soil with compost, and plant and water in the gardens. Some of our neighbours and friends have been inspired to build garden boxes, with the wood their Neighbourhood Nature Club reclaimed from a dumpster, and start their own home gardens this season. In an attempt to be environmentally friendly, while participating in community sports, Tyson and family recently cycled from their home in south-WEST Lethbridge to the east-side Soccer Centre for pictures, then on to the north side for horse chores, and returning home in the early evening, with a few stops at parks along the way! The cycle trip was an awesome adventure: feeling the air, seeing the pelicans fly overhead, stopping to watch the river under the bridge, connecting with friends and friendly people, and getting to know the good and bad of the bike paths in Lethbridge. Gardening and cycling in and between neighbourhoods were two areas of focus in Tyson's "Caring for Our Watershed" proposal on Neighbourhood Stewards and Nature Clubs. Other topics of his presentation ranged from building relationship with local ecosystem, including our neighbours, to alternative energy, and Rachel Carson's advice that "If a child is to keep alive his inborn sense of wonder ..., he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in."

Through attending the Oldman Watershed Council's Youth Forum, in March of this year, Tyson learned about an essay contest that Agrium was hosting called "Caring for Our Watersheds, which asked the question "What can you do to improve your watershed?" Tyson chose to enter this contest, and from the essay he submitted was selected as one of the 10 finalists, being asked to give a five minute presentation at the Calgary Zoo on May 8, where he placed 4th in his category, grade 7 – 9, south of Red Deer. Tyson was awarded $400 which he plans to use to help purchase his mountain bike, and is able to apply for $1000 to further fund his project. Through SACEE, SAGE was chosen to receive a matching $400 awarded by Agrium. SAGE will use the money to sponsor his presentations promoting stewardship in our watershed, with an initial presentation and guided discovery experience planned for May 28 at Westminster School, focussing on neighbourhood stewardship and protecting the Castle-Crown area, the headwaters of our Oldman River. Tyson is looking forward to being able to present and discuss his project with a variety of groups within Lethbridge and area. The recent experience of preparing for and being awarded the Leaders of Tomorrow Volunteer Excellence Award, through Volunteer Lethbridge, and the Helen Schuler Nature Centre's nomination, has assisted Tyson with this watershed project.

Sherri on behalf of Tyson Bohnert